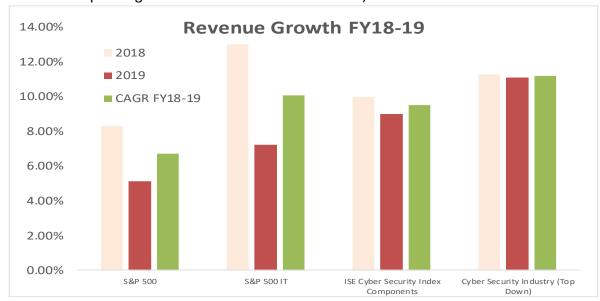
BAH US - Decoding Cyber Security Stocks

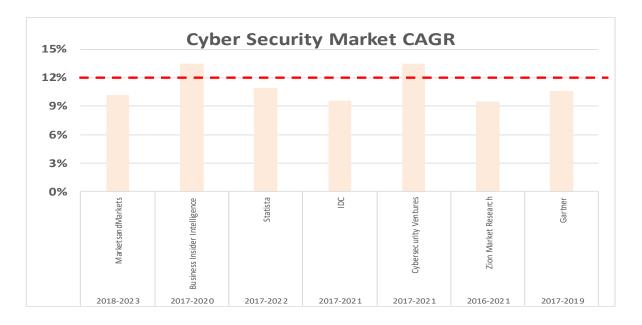
prepared by Carlos Salas Najera

November 2018

Cyber Security – Market Forecasts and Hype Cycle Stage

- Cyber Security is expected to be one of the most fast-pacing industries globally from an organic and non-organic standpoint within the next 5-10 years.
- Independent research firms and consultancy companies forecast a 10.8% CAGR within the next five years with CAGR surpassing 11% for the FY18-20 period.
- This superior growth is sustained not by short-lived sources but sustainable drivers such as: a dynamic threat landscape, regulatory pressures (GDPR), technological architectural changes, tailwinds coming from a megatrends (new IoT economy, corporates transition to digital and increasing e-commerce platforms importance).
- Security breach-related costs are expected to keep on growing to surpass 6 trillion
 USD by 2021 compared to 3 trillion USD in 2015; which renders insufficient the
 current Global annual Cyber Security expenditure allocation (between 100 and 250
 bn USD depending on whether or not IoT is included).

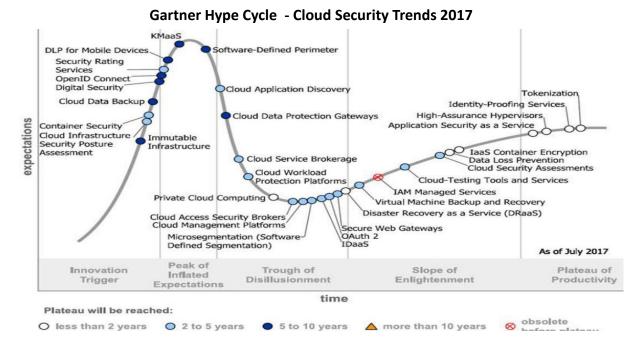




- On a relative basis Cyber Security displays as well a more dynamic sales growth compared to the overall S&P 500 market or the whole IT sector in 2019.
- The most interesting point is the mismatch for the Cyber Security industry between top down and bottom up estimates, which gives room for upgrades looking forward 2019 and 2020.
- Geographically speaking, North America will continue to be the largest market with around 45% market share, yet Asia Pacific is to experience the fastest CAGR within the next 5 years with CAGR~19%.
- Financial services holds the largest market share and is anticipated to maintain its dominance. Other high growth sectors will be A&D, Telecom and healthcare.

Cyber Security – Segments and Hype Cycle Stage

- Cloud Security is the star segment with forecasts +50% CAGR and a low base within
 the next years as business digitalization, e-commerce platforms and IoT increase
 will boost the need for Cloud-centric security solutions.
- Gartner believes regulatory and privacy concerns will drive at least 10% of market demand for security services through 2019 impacting a variety of segments, such as identity and access management (IAM), and Data Security.
- Consumer Security Software as the tortoise in the race. This niche is infested of competitors and a fierce price competition to slash prices to lure subscribers.
 Worse yet, most of the big guns are present in this segment making it even more difficult for an average peer to outsmart them in terms of R&D budget.



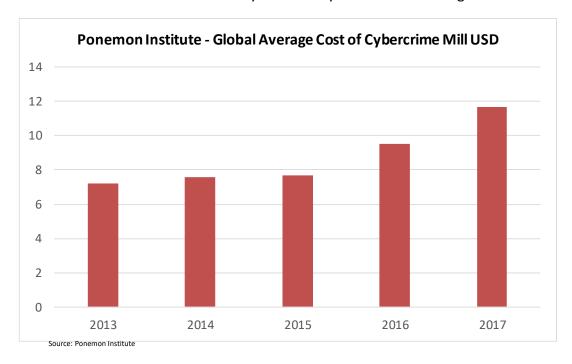
Gartner Cyber Security Projections	2017 (mn \$)	2018	2019	CAGR
Application Security	2,434	12.7%	9.5%	11.1%
Cloud Security	185	64.3%	51.0%	57.5%
Data Security	2,563	19.5%	15.1%	17.3%
Identity Access Management	8,823	10.7%	8.3%	9.5%
Infrastructure Protection	12,583	12.1%	8.7%	10.4%
Integrated Risk Management	3,949	10.1%	8.4%	9.2%
Network Security	10,911	13.9%	7.2%	10.5%
Other Infor. Security Software	1,832	13.5%	9.9%	11.7%
Security Services	52,315	12.6%	9.0%	10.8%
Consumer Security Software	5,948	7.5%	4.2%	5.8%
Total	101,544	12.4%	8.7%	10.6%

Source: Gartner

- The delusional hype for Cloud Security trends is gone with most of the trends entering into "slope of enlightenment phase" tantamount to higher product feasibility, increasing client adoption and substantial monetization going forward.
- Licensing business model phasing out: following other software industries, Cyber Security firms have embraced SaaS model with more than 50% of the software delivery expected to be cloud-based by 2020. As a result, Cyber Security players will boost their cash flow stability and business quality score.
- Key within Cloud Security is encryption. Because so much information is now transmitted over wireless networks, encryption becomes more important and is expected to experience tremendous growth within the next 5 years.

Cyber Security – Cybercrime and GDPR

- GDPR (General Data Protection Regulation) is a regulation in EU law on data protection and privacy for all individuals within the EU and EEA.
- In addition, corporates worldwide having even a small exposure to EU countries will
 be exposed to expensive GDPR fines should they decide to lag in terms of security
 spending and neglect a proper security framework.
- For instance, failure to report a breach to a regulator within 72 hours will trigger a Tier 1 fine (maximum between 10 mn EUR or 2% Global annual turnover).
- GDPR-Cyber Security connecting dots: Advanced Network Sandboxing, Identity and Access Management, Encryption, Vulnerability Management, Endpoint Security, Data Loss Prevention and Staff Cyber Security Awareness Training.



GDPR Fines – Determined by Severity and Nature of the infringement

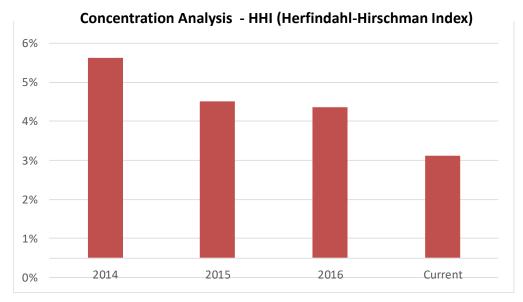


Source: GDPR

- Ponemon Institute reports a an average cost per Cybercrime of 11.7 mill USD growing +12.9% CAGR since 2013 with bleak projections going forward as IoT and Digitalization increase the vulnerability of the security architectures.
- Overall, Cybercrime costs are approximately 600bn USD per annum or 0.8% global GDP (source: CSIS) tantamount to 6 times the size of the Cyber Security industry.
- GDPR fines will exacerbate even further the impact of cybercrime costs. Worse yet,
 the impact on brand tarnishment from a security breach is very difficult to asses
 due to the intangible nature of the asset e.g. TSB and Equifax data breaches.
- A CTO survey as of June 2018 has yield an impressive result: 45% of the respondents expect to accelerate security spending, being this segment the highest priority ahead of SaaS (33%), Analytics (31%), Cloud (30%) or Storage (25%).

Cyber Security – Market Competitive Structure

- 4-firm concentration ratio (6%) indicates perfect competition among industry incumbents compared to what competition panels considers "Oligopoly" (50-80%).
- HHI (Herfindahl-Hirschman Index) at 3% indicates perfect competition as well compared to what competition panels considers "Oligopoly" (+25%).
- The market share mix between public and private companies is 50/50 with Momentum Cyber, an advisory firm focused on cyber industry mergers and acquisitions, confirming it tracks 2,500 security companies.
- Despite a more fragmented market, T12M EPS and 3YR Average EPS growth for listed stocks has been positive with 13% YoY and 3% CAGR, respectively. New private startups seem to be not hurting listed players with some exceptions (e.g. Symantec) as listed-mid caps with niche expertise seem to be becoming winners.



Cyber Security Industry – Competitive Analysis

Public Incumbents	84						
Private Incumbents	2416						
Industry Size (Mn USD)	138,000	Multiple Providers Median					
Top 5 Mkt Share	12%						
Top 10	19%						
Concentration Measure	Results	Conclusion					
4CR	10%	Perfect Competition to Moderate Oligopoly					
Herfindahl Index	0.03	Perfect Competition					
4CR (4-firm Concentration Ratio)	Market						
0	Perfect Competition						
0-50	Perfect Competition to Moderate Oligopoly						
50-80	Oligopoly						
80-100	Oligopoly to Moderate Monopoly						
100	Extremely Concentrated Oligopoly to Monopoly						
Herfindahl Index	Market						
<0.1	Perfect Competition						
0.1-0.25	Perfect Competition to Oligopoly						
>0.25	Oligopoly						
1	Oligopoly to Monopoly						

Source: Bloomberg data as of September 2018

- HHI (Herfindahl-Hirschman Index) has diminished to 3% from 5% in 2014. However,
 this is not a meaningful increase in competition as remember that HHI<10%
 indicates "perfect competition" so there has not been a meaningful change in
 competitiveness that really could shake the profitability of the industry.
- VC has been behind the surge of new Cyber Security startups with around 300 launches every year as low interest rates lure PE investors to high-growth areas.
- Data shows that dollars invested in Security Software companies approximately doubled yoy, with average deal sizes up about 40% YoY (source: CB Insights).
- Nonetheless, listed Cyber Security stocks have not experienced on average profitability issues and CTO surveys have shown they are more willing to consolidate current vendors (>50% vs <40% 2016) than test new alternatives.

Source: Bloomberg data as of September 2018

Cyber Security - Top-Down | Competitive Scoring

	_							•	<u> </u>					•										
BIG GUNS IN RED			Cy	yber Secur	rity Exposu	ire	Industry Experts Study		Segment Competition Analysis						Client Reviews	CYBER SECURITY SEGMENTS								
Name	Niche	OVERALL SCORE	Cybe Core Business	HACK ETF Member	Niche Growth Exposure Score	Overall Exposure Score	CyberSecurity Ventures Score	Competetive Easyness vs Big Guns Score	Competetive Easyness (num of Comp)	R&D Intensity (R&D/Sales) Score	R&D Size (USD) Score	Overall Competitive Score	Defence Contractor	Biometrics Company	% Perc Score	Application Security	Cloud Security	Data Security	Identity Access Management	Infrastructur e Protection	Integrated Risk Management	Network Security	Security Services	Consumer Security Software
CyberArk	Privileged Access Security	77%	1	1	23%	74%	99.6%	75%	70%	52%	46%	61%	0	0	75%									
Raytheon Cisco	Cyber Security Services	61% 58%	0	0	1% 44%	0% 48%	99.4% 99.2%	100%	100%	100%	38%	85%	1	0	240/									
IBM	Threat Protection & Network Security Enterprise IT Security Solutions	50%	0	0	55%	18%	99.2%	27% 48%	53% 43%	41% 32%	87% 74%	52% 49%	0	0	31% 34%									
Microsoft	Datacenter to Endpoint Protection	48%	0	0	34%	18%	98.8%	24%	44%	44%	99%	53%	0	0	30%									
FireEye	Advanced Threat Protection	74%	1	1	35%	78%	98.4%	34%	58%	95%	91%	69%	0	0	52%									
Lockheed Martin	Cybersecurity Solutions & Services	60%	0	0	1%	0%	98.2%	100%	100%	100%	31%	83%	1	0										
Check Point Software	Unified Threat Management	69%	1	1	32%	77%	98.0%	31%	77%	37%	83%	57%	0	0	43%									
Symantec	Endpoint, Cloud & Mobile Security	74%	1	1	51%	84%	97.6%	16%	73%	68%	100%	64%	0	0	51%									
BAE Systems	Cybersecurity Risk Management	70%	0	1	1%	34%	97.4%	100%	100%	100%	78%	95%	1	0	56%									
Booz Allen Palo Alto Networks	Cybersecurity Solutions & Services Threat Detection & Prevention	80% 77%	1	1	1% 45%	67% 82%	97.2% 97.0%	100% 30%	100% 76%	100% 59%	97%	75% 66%	0	0	63%									
Rapid7	Threat Detection & Prevention Security Data & Analytics Solution	77%	1	1	56%	85%	96.8%	74%	47%	85%	56%	65%	0	0	59%									
Proofpoint	Security bata & Analytics solution	79%	1	1	74%	91%	96.6%	23%	49%	84%	82%	59%	0	0	71%									
Splunk	Big Data Security	78%	1	1	50%	83%	96.4%	52%	65%	81%	94%	73%	0	0	60%									
SecureWorks	Managed Security Services	76%	1	1	68%	89%	96.2%	47%	71%	57%	72%	62%	0	0	58%									
Intel	McAfee/Hardware Enabled Security	55%	0	0	38%	13%	95.8%	13%	80%	72%	95%	65%	0	0	47%									
Carbon Black	Endpoint & Server Security Platform	62%	1	1	22%	74%	95.6%	11%	35%	94%	49%	47%	0	0	31%									
Northrop Grumman	Cyber & Homeland Security Services	61%	0	0	1%	0%	95.2%	100%	100%	100%	53%	88%	1	0	44-1									
Fortinet Mimecast	Enterprise Security Solutions Email Security	67% 80%	1	1	30% 85%	77% 95%	95.0% 94.8%	35% 22%	46% 74%	47% 48%	88% 42%	54% 47%	0	0	41% 82%									
Sophos	Email Security Anti-Virus & Malware Protection	70%	1	1	52%	95% 84%	94.8%	33%	67%	48% 80%	42% 79%	47% 65%	0	0	38%									
BT	Security & Risk Management Solution:	47%	0	0	60%	20%	94.4%	11%	29%	19%	13%	18%	0	0	56%									
Trend Micro	Server, Cloud, and Content Security	68%	1	1	38%	79%	94.0%	12%	82%	27%	68%	47%	0	0	51%									
Accenture	Enterprise Security Strategy	34%	0	0	60%	20%	93.6%	11%	29%	14%	40%	23%	0	0	0%									
Tenable Network Security		76%	1	1	76%	92%	92.6%	100%	93%	91%	58%	85%	0	0	33%									
BlackBerry	Mobile & Data Security	56%	0	0	71%	24%	92.4%	57%	86%	86%	36%	66%	0	0	40%									
Avast	Cyber Attack Protection	39%	1	0	0%	33%	92.2%	0%	15%	38%	69%	31%	0	0	0%									
AT&T Dell EMC CSG	Managed Security & Consulting	41% 50%	0	0	60% 54%	20% 18%	92.0% 91.8%	11% 49%	29% 68%	13% 58%	27% 77%	20% 63%	0	0	33% 27%									
Imperva	Holistic Cyber Solutions Data & Applications Security	73%	1	1	78%	93%	91.8%	74%	64%	67%	65%	67%	0	0	39%									
DXC Technology	Cybersecurity Services & Solutions	41%	0	0	60%	20%	90.0%	11%	29%	0%	0%	10%	0	0	44%									
Google	Project Shield for News Sites	63%	0	0	85%	28%	89.6%	47%	17%	49%	55%	42%	0	0	93%									
L-3 Technologies	National Security Solutions	57%	0	0	1%	0%	89.4%	100%	100%	100%	29%	82%	1	0										
Oracle	Identity Security Operations Center	45%	0	0	95%	32%	89.2%	15%	39%	51%	60%	41%	0	0	19%									
SAIC	Cybersecurity Professional Services	77%	1	1	1%	67%	88.2%	100%	100%	100%	0%	75%	1	0										
	Cybersecurity for Federal Government	60%	0	0	1%	0%	88.0% 87.8%	100% 74%	100% 64%	100% 34%	62%	90% 65%	0	0	17%									
Akamai Technologies Qualvs	Secure Cloud & Mobile Computing Cloud Security & Compliance	65%	1	1	78% 90%	93% 97%	87.8% 87.6%	74%	20%	62%	90% 45%	50%	0	0	26%									
Verizon	Network & Data Security	38%	0	0	72%	24%	87.4%	47%	30%	0%	0%	19%	0	0	19%									
F-Secure	Internet Security for All Devices	74%	1	1	56%	85%	86.2%	56%	89%	70%	44%	65%	0	0	62%									
VMware	Mobile, Data Center & Cloud Security	52%	0	0	85%	28%	85.6%	29%	56%	78%	92%	64%	0	0	29%									
	Threat Intelligence & Network Security	49%	0	1	40%	47%	85.2%	53%	79%	65%	59%	64%	0	0	0%									
Radware	Application Security & Delivery	72%	1	1	78%	93%	84.8%	74%	64%	90%	64%	73%	0	0	39%									
A10 Networks	DDoS & Cloud Protection Cyber Defense Solutions	87% 58%	1	1	78% 1%	93% 67%	84.4% 84.2%	74% 100%	64% 100%	87% 100%	63%	72% 81%	0	0	100%									
HPE	Cyber Defense Solutions Enterprise Blockchain Solutions	33%	0	0	59%	20%	84.2%	22%	50%	15%	23%	29%	0	0	0%									
ForeScout	Network Security & Access Control	63%	1	1	78%	93%	83.4%	74%	99%	75%	54%	75%	0	0	0%									
CYREN	Web, Email & Mobile Security	77%	1	0	46%	49%	81.4%	74%	41%	92%	100%	77%	0	0	100%									
F5	Cloud & Data Center Security	62%	1	1	68%	89%	79.8%	56%	36%	54%	96%	61%	0	0	19%									
Zscaler	Security-as-a-Service Solutions	67%	1	1	40%	80%	78.8%	29%	96%	71%	41%	59%	0	0	52%									
CACI	ntelligence, Defense & Federal Securit	73%	1	1	1%	67%	77.0%	100%	100%	100%	0%	75%	1	0										
NXT-ID	Biometrics	63%	1	0	98%	66%	76.6%	100%	071	30%	12%	47%	0	1	257									
Globalscape OneSpan Inc	Secure File Transfer luthentication & e-Signature Solution	48% 49%	1	0	91% 23%	64% 74%	76.4% 74.1%	47% 11%	9% 33%	35% 39%	17% 32%	27% 29%	0	0	25% 20%									
VeriSign	Internet Security Solutions	79%	1	1	46%	82%	74.1%	100%	97%	25%	100%	81%	0	0	20%									
KEYW	Cyber Defense & Digital Forensics	71%	1	1	1%	67%	71.3%	100%	100%	100%	0%	75%	1	0										
AhnLab	Internet Security Solutions	69%	1	1	21%	74%	70.3%	25%	52%	82%	37%	49%	0	0	81%									
ZixCorp	Email Encryption & Data Protection	67%	1	1	37%	79%	67.3%	11%	91%	53%	26%	45%	0	0	78%									
NCC Group	Information Assurance Services	67%	1	1	60%	87%	65.5%	74%	8%	11%	100%	48%	0	0										
NetScout	uational Awareness & Incident Respo	77%	1	1	46%	82%	62.7%	74%	14%	77%	86%	63%	0	0	100%									
Okta Infoblox	Enterprise Identity Management	72% 64%	1	0	23% 60%	74% 53%	58.5% 56.5%	22% 74%	32%	89% 66%	73% 67%	54% 73%	0	0	100% 75%									
Precise Biometrics AB	Automated Network Control & Security Biometrics	63%	1	0	98%	66%	56.5%	100%	85%	99%	15%	73% 71%	0	1	75%									
SailPoint	Identity & Access Management	52%	1	1	23%	74%	48.8%	74%	55%	61%	33%	56%	0	0	30%									
Varonis	Data Security & Analytics	75%	1	1	76%	92%	33.2%	74%	94%	76%	50%	73%	0	0	100%									
INSIDE Secure	Smartphone & Mobile Device Security	43%	1	0	89%	63%	24.3%	22%	18%	96%	28%	41%	0	0										
	Privileged Access Control, Encryption	36%	1	0	33%	44%	21.7%	47%	8%	97%	22%	43%	0	0										
Fingerprint Cards AB	Biometrics	47%	1	0	98%	66%	15.7%	100%		43%	35%	59%	0	1										
Finjan Holdings	Cybersecurity IP Licensing	31%	1	0	73%	58%	9.9%	47%	12%	22%	18%	25%	0	0										
Verint	/ Intelligence, Surveillance & Fraud D	58% 49%	1	1	1% 40%	67% 80%	6.5% 1.3%	100%	100%	100%	100%	100%	1	0	41%									
MobileIron Commvault	Enterprise Mobility Management data backup and recovery	49% 69%	1	1	40% 91%	80% 97%	1.3% Not Ranked	47% 47%	83% 38%	100% 46%	71% 76%	75% 52%	0	0	41% 57%									
Carbonite	Online Backup Service	67%	1	1	91%	97%	Not Ranked	47%	21%	63%	47%	45%	0	0	58%									
Mantech International	Cyber Security Services	71%	1	1	1%	67%	Not Ranked	100%	100%	100%	0%	75%	1	0	30,0									
Everbridge	SaaS-based communications provide	75%	0	1	60%	53%	Not Ranked	100%	100%	73%	19%	73%	0	0	100%									
Ultra	Aerospace & Defence	57%	0	1	1%	34%	Not Ranked	100%	100%	100%	21%	80%	1	0										
Digital Arts	Email Anti-Spam Solutions	70%	1	1		100%	Not Ranked	100%		9%	9%	39%	0	0										
FFRI INC	Endpoint Security Software	29%	1	0	29%	43%	Not Ranked	22%	3%	28%	10%	16%	0	0										

- The Top-Down competitive scoring developed uses multiple dimensions such as Cyber Security Exposure, Industry Experts Opinion, Cyber Segment Competition Analysis and Client Reviews:
- Cyber Security exposure: companies are scored depending on whether or not they are part of the Cyber Security Index and researching if Cyber Security is their core business. Moreover, "Niche Growth Exposure Score" takes into account each company's Cyber Security expertise and their respective forecast growth to understand every firm growth profile henceforth.
- Industry Experts Study: "Cybersecurity Ventures 500 selection"
 ranking is used. Cybersecurity Ventures is a Cyber-focused research
 firm whose criteria to create its ranking uses feedback from
 industry experts, industry management interviews, product
 reviews, among others.
- Segment Competitive Analysis: multiple factors are used to assess
 the competitiveness of each company per segment: the number of
 big guns competing against, the number of total incumbents in a
 particular segment, R&D size and R&D intensity (%Sales) and
 whether or not they are defence contractors.
- Client Reviews: "Gartner Peer insights" are professional opinions verified by Gartner. Each company's segment products reviews have been gathered and compared against their segment rivals.

Cyber Security – Bottom-Up | Quantamental Scoring

		Market
		Сар
Name	Cyber Security Niche	(Mill
		USD)
CYBERARK SOFTWARE LTD/ISRAEL	Privileged Access Security	2,631
RAYTHEON COMPANY	Cyber Security Services	58,655
CISCO SYSTEMS INC	Threat Protection & Network Security	222,441 138.531
MICROSOFT CORP	Enterprise IT Security Solutions Datacenter to Endpoint Protection	138,531 875,787
FIREFYE INC	Advanced Threat Protection	3.280
LOCKHEED MARTIN CORP	Cybersecurity Solutions & Services	98,122
CHECK POINT SOFTWARE TECH	Unified Threat Management	18,550
SYMANTEC CORP	Endpoint, Cloud & Mobile Security	13,111
BAE SYSTEMS PLC	Cybersecurity Risk Management	26,274
BOOZ ALLEN HAMILTON HOLDINGS PALO ALTO NETWORKS INC	Cybers ecurity Solutions & Services Threat Detection & Prevention	7,172 21,270
RAPIDZ INC	Threat Detection & Prevention Security Data & Analytics Solution	1.742
PROOFPOINT INC	Security-as-a-Service	5,456
SPLUNK INC	Big Data Security	17,309
SECUREWORKS CORP - A	Managed Security Services	1,149
INTEL CORP	McAfee/Hardware Enabled Security	212,060
CARBON BLACK INC	Endpoint & Server Security Platform	1,586
NORTHROP GRUMMAN CORP FORTINET INC	Cyber & Homeland Security Services Enterprise Security Solutions	54,697 15,122
MIMECAST LTD	Email Security	2,540
SOPHOS GROUP PLC	Anti-Virus & Malware Protection	3,145
BT GROUP PLC	Security & Risk Management Solutions	29,400
TREND MICRO INC	Server, Cloud, and Content Security	9,066
ACCENTURE PLC-CL A	Enterprise Security Strategy	110,951
TENABLE HOLDINGS INC	Vulnerability Scanning	3,529
BLACKBERRY LTD	Mobile & Data Security	5,582
AVAST PLC AT&T INC	Cyber Attack Protection Managed Security & Consulting	3,644 245.419
DELL TECHNOLOGIES INC-CL V	Holistic Cyber Solutions	19.319
IMPERVA INC	Data & Applications Security	1.639
DXC TECHNOLOGY CO	Cybersecurity Services & Solutions	26,533
ALPHABET INC-CL C	Project Shield for News Sites	822,512
L3 TECHNOLOGIES INC	National Security Solutions	16,584
ORACLE CORP	Identity Security Operations Center	196,330
SCIENCE APPLICATIONS INTE	Cybersecurity Professional Services	3,465
SIEMENS AG-REG AKAMAI TECHNOLOGIES INC	Cybersecurity for Federal Government	111,203 12,376
QUALYS INC	Secure Cloud & Mobile Computing Cloud Security & Compliance	3.482
VERIZON COMMUNICATIONS INC	Network & Data Security	220,357
F-SECURE OYJ	Internet Security for All Devices	584
VMWARE INC-CLASS A	Mobile, Data Center & Cloud Security	64,445
JUNIPER NETWORKS INC	Threat Intelligence & Network Security	10,242
RADWARE LTD	Application Security & Delivery	1,172 439
LEIDOS HOLDINGS INC	DDoS & Cloud Protection Cyber Defense Solutions	10,391
HP INC	Enterprise Blockchain Solutions	41,206
FORESCOUT TECHNOLOGIES INC	Network Security & Access Control	1,671
CYREN LTD	Web, Email & Mobile Security	163
F5 NETWORKS INC	Cloud & Data Center Security	11,888
ZSCALER INC	Security-as-a-Service Solutions	5,032
CACI INTERNATIONAL INC -CL A	Intelligence, Defense & Federal Security	4,585 34
NXT-ID INC GLOBALSCAPE INC	Biometrics	34 85
ONESPAN INC	Secure File Transfer Authentication & e-Signature Solutions	778
VERISIGN INC	Internet Security Solutions	19.552
AHNLAB INC	Internet Security Solutions	480
ZIX CORP	Email Encryption & Data Protection	298
NCC GROUP PLC	Information Assurance Services	762
NETSCOUT SYSTEMS INC		2,029
OKTA INC	Enterprise Identity Management	7,612 6
INFOBLOX INC PRECISE BIOMETRICS AB	Automated Network Control & Security Biometrics	67
SAILPOINT TECHNOLOGIES HOLDI	Identity & Access Management	3,039
VARONIS SYSTEMS INC	Data Security & Analytics	2,149
INSIDE SECURE SA	Smartphone & Mobile Device Security	138
SSH COMMUNICATIONS SECURITY	Privileged Access Control, Encryption	86
FINGERPRINT CARDS AB-B	Biometrics	371
FINJAN HOLDINGS INC	Cybersecurity IP Licensing	119
VERINT SYSTEMS INC MOBILEIRON INC	Security Intelligence, Surveillance & Fraud Detection	3,218 542
MOBILEIRON INC COMMVAULT SYSTEMS INC	Enterprise Mobility Management data backup and recovery	542 3,179
CARBONITE INC	Online Backup Service	1,266
MANTECH INTERNATIONAL CORP-A	Cyber Security Services	2,517
EVERBRIDGE INC	SaaS-based communications provider	1,720
ULTRA ELECTRONICS HLDGS PLC	Aerospace & Defence	1,540
DIGITAL ARTS INC	Email Anti-Spam Solutions	692
FFRI INC	Endpoint Security Software	242

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VALUATION	GROWTH	PROFITABILITY	QUALITY	MOMENTUM	SCORE
26% 59%	64% 40%	54% 61%	41% 55%	61% 33%	45% 52%
		48%			
55% 69%	33% 26%	48% 53%	44% 48%	66% 53%	49% 52%
38%	69%	53%	48% 50%	74%	52% 54%
24%	80%	38%	45%	47%	43%
50%	45%	71%	62%	46%	55%
35%	54%	69%	51%	41%	48%
59%	53%	42%	39%	36%	47%
67%	34%	44%	67%	35%	54%
57%	50%	62%	57%	65%	58%
19%	80%	27%	60%	58%	45%
20%	60%	35%	41%	58%	39%
20%	68%	43%	58%	14%	39%
13%	70%	55%	53%	55%	44%
48%	31%	36%	44%	81%	48%
64%	46%	57%	65%	29%	55%
38%	47%	29%	31%	42%	37%
51%	50%	45%	57%	45%	51%
18%	80%	68%	60%	84%	55%
19%	53%	41%	44%	52%	39%
37%	37%	47%	29%	34%	36%
45%	18%	32%	66%	24%	41%
57%	57%	60%	61%	53%	58%
50%	55%	70%	69%	47%	58%
30%	50%	49%	31%	64%	41%
30%	42%	36%	54%	36%	40%
32%	24%	32%	45%	50%	37%
79%	51%	46%	49%	42%	57%
31%	41%	62%	19%	56%	38%
38%	68%	40%	57%	40%	48%
78%	16%	50%	40%	63%	53%
27%	65%	54%	51%	39%	44%
61%	29%	40%	49%	50%	48%
54%	40%	53%	49%	68%	53%
68%	45%	63%	58%	39%	57%
71%	37%	41%	52%	40%	52%
35%	39%	39%	46%	30%	38%
24%	71%	49%	59%	57%	48%
70%	49%	48%	42%	53%	54%
50%	33%	57%	58%	32%	48%
32%	32%	56%	51%	61%	45%
71%	29%	36%	39%	55%	49%
35%	57%	54%	54%	34%	46%
	59%	45%	40%		44%
51% 75%	42%	45% 45%	40%	19% 42%	53%
				49%	
81%	38%	62%	67%		63%
35% 39%	40% 34%	48% 21%	42% 58%	66% 57%	44% 43%
38%	63%	70%	63%	63%	56%
18%	42%	47%	55%	56%	41%
63%	51%	65%	47%	67%	58%
52%	46%	29%	40%	9%	38%
71%	30%	41%	49%	32%	49%
38%	55%	54%	42%	76%	50%
32%	51%	82%	49%	77%	53%
77%	68%	66%	50%	25%	60%
47%	50%	53%	33%	50%	45%
67%	42%	55%	65%	37%	56%
60%	41%	38%	39%	30%	44%
13%	48%	39%	63%	72%	44%
36%	62%	59%	58%	15%	46%
35%	48%	23%	51%	26%	38%
25%	29%	33%	53%	76%	41%
24%	69%	58%	36%	52%	43%
68%	62%	59%	54%	39%	58%
30%	56%	79%	61%	33%	49%
53%	40%	12%	55%	41%	44%
76%	52%	81%	76%	63%	71%
52%	60%	53%	51%	65%	55%
39%	73%	43%	41%	39%	45%
29%	42%	54%	57%	60%	46%
30%	53%	47%	38%	55%	42%
70%	49%	56%	63%	48%	60%
20%	41%	30%	63%	58%	41%
77%	31%	43%	68%	49%	59%
33%	42%	54%	57%	48%	46%
21%	26%	679/	E 00/	430/	200/

- The Bottom-up Quantamental Scoring uses a wide array of fundamental, market and technical indicators tailored to asses a Cyber Security business. Both profitable backtested indicators and fundamental metrics related the key drivers of a Cyber Security business (e.g. R&D-to-Sales) are considered.
- An overall weighted-score is calculated from measuring each company's Valuation(30% weight), Growth (15%), Profitability (15%), Quality (25%) and Momentum (15%) profile score with multiple variables used to attain a comprehensive output:
- Valuation: Price-to-Sales, Price-to-Book, Dividend Yield, FCF Yield, EV/T12M EBITDA and popularity (number of analysts covering the stock).
- **Growth:** Revenue growth, 5YR Revenue Growth, R&D-to-Sales, T12M EPS growth and 3YR Average EPS Growth.
- Profitability: Gross Margin, Gross Margin YoY, Operating Margin, ROIC,
 Asset Turnover, Asset Turnover Change.
- Quality: Altman's Z-Score, Total Debt-to-EBITDA, Operating Leverage,
 Operating Margin Volatility, Interest Cover, WACC Optimization,
 Sales/EPS/CFO Persistence, EVA Spread, EVA Change.
- Momentum: 5 Days-to-20 Days MA Trading Volume, 6-month Price Momentum, Price-to-200d MA, 14-day RSI, 1-month Earnings Momentum.

Cyber Security – Screening Candidates

TOP DOWN TOP 10

Name	Cyber Security Niche	Marke t Cap (Mill USD)
BOOZ ALLEN HAMILTON HOLDINGS	Cybersecurity Salutions & Services	7,172
MIMECAST LTD	Email Security	2,540
PROOFPOINT INC	Security-ar-a-Service	5,456
VERISIGN INC	Internet Security Solutions	19,552
SPLUNK INC	Biq Data Socurity	17,309
CYBERARK SOFTWARE LTD/ISRAEL	Privileged Access Security	2,631
NETSCOUT SYSTEMS INC	Situational Awareness & Incident Response	2,029
SCIENCE APPLICATIONS INTE	Cybersecurity Professional Services	3,465
PALO ALTO NETWORKS INC	Throat Dotoction & Provention	21,270
RAPID7 INC	Socurity Data & Analytics Solution	1,742

	BOTTON	I-UP QUANTA	MENTAL SCO	DRING		ı						TOP	-DOWN	COMP	ETITIVE S	CORING	ì				
		STYLES C	ORE					S	yper Secur	try Exper	Segm	Client Revie ws			CYBE	ER SEC	URITY	SEGME	ENTS		
T ALUATION	GROWTH	PROFITABILITT	QUALITT	НОНЕНТИН	BU SCORE		TD SCORE	Ex		CyberSe curity Tentures Scure	Overell Competi tive Score	% Perc Scare	Applicat inn Security	Claud Security	Data Security	Identity Access Henege ment	Infrartru cture Pratecti an	Integrat ed Rick Hanage ment	Hetuurk Security	Security	Conrume r Security Softwar
57%	50%	62%	57%	65%	58%		80%		67%	97.2%	75%										
19%	53%	41%	44%	52%	39%		80%		95%	94.8%	47%	82%									
20%	68%	43%	58%	14%	39%		79%		91%	96.6%	59%	71%									
32%	51%	82%	49%	77%	53%		79%		82%	73.3%	81%										
13%	70%	55%	53%	55%	44%		78%		83%	96.4%	73%	60%									
26%	64%	54%	41%	61%	45%		77%		74%	99.6%	61%	75%									
60%	41%	38%	39%	30%	44%		77%		82%	62.7%	63%	100%									
68%	45%	63%	58%	39%	57%		77%	_	67%	88.2%	75%										
19%	80%	27%	60%	58%	45%		77%		82%	97.0%	66%	63%									
20%	60%	35%	41%	58%	39%		77%		85%	96.8%	65%	59%									

BOTTOM UP TOP 10

	Name	Cyber Security Niche	Marke t Cap (Mill USD)
\	HP INC	Enterprise Blackchain Salutions	41,206
	MANTECH INTERNATIONAL CORP-A	Cyber Security Services	2,517
	ULTRA ELECTRONICS HLDGS PLC	Acraspace & Defence	1,540
	ACCENTURE PLC-CL A	Entorpriro Socurity Stratogy	110,951
	CACHINTERNATIONAL INC -CL A	Intolligence, Defense & Federal Security	4,585
	TREND MICRO INC	Server, Claud, and Cantent Security	9,066
	BOOZ ALLEN HAMILTON HOLDINGS	Cyborsocurity Salutions & Sorvices	7,172
	AT&T INC	Managed Security & Consulting	245,419
	SCIENCE APPLICATIONS INTE	Cybersecurity Professional Services	3,465
	F5 NETWORKS INC	Cloud & Data Contor Socurity	11,888

	BOTTON	1-UP QUANTA	MENTAL SC	ORING		TOP-DOWN COMPETITIVE SCORING															
		STYLES C	ORE						Cyber Secur ity		ent	Client Revie ws			CYBE	R SEC	URITY	SEGME	NTS		
TALUATION	GROWTH	PROFITABILITY	QUALITY	МОМЕНТИМ	BU SCORE		TD SCORE		Overall Expurere Scure	CyberSe curity Tentures Scure	Overall Competi tive Score	% Perc Scure	Applicat inn Søcurity	Claud Security	Data Security	Identity Access Heneqe ment	Infrartru cture Pratecti	ed Rick	Hetuurk Security	Security	Conreme r Security Saftuer
81%	38%	62%	67%	49%	63%		33%		20%	83.6%	29%	0%									
70%	49%	56%	63%	48%	60%		71%		67%	lot Ranke	75%										
77%	31%	43%	68%	49%	59%		57%		34%	Jot Ranke	80%										
50%	55%	70%	69%	47%	58%		34%		20%	93.6%	23%	0%									
63%	51%	65%	47%	67%	58%		73%		67%	77.0%	75%										
57%	57%	60%	61%	53%	58%		68%	╝	79%	94.0%	47%	51%									
57%	50%	62%	57%	65%	58%		80%	Ц	67%	97.2%	75%										
79%	51%	46%	49%	42%	57%		41%	╝	20%	92.0%	20%	33%									
68%	45%	63%	58%	39%	57%		77%	Ц	67%	88.2%	75%										
38%	63%	70%	63%	63%	56%		62%	ı	89%	79.8%	61%	19%	l								l l

HYBRID Min TD and BU Score >50%

Name	Cyber Security Niche	Marke t Cap (Mill USD)
MANTECH INTERNATIONAL CORP-A	Cybor Socurity Sorvices	2,517
ULTRA ELECTRONICS HLDGS PLC	Aorarpaco & Dofonco	1,540
CACHINTERNATIONAL INC -CL A	Intolligonco, Dofonzo & Fodoral Socurity	4,585
TREND MICRO INC	Server, Claud, and Cantent Security	9,066
BOOZ ALLEN HAMILTON HOLDINGS	Cyborsocurity Salutions & Services	7,172
SCIENCE APPLICATIONS INTE	Cybersecurity Professional Services	3,465
F5 NETWORKS INC	Cloud & Data Contor Security	11,888
NCC GROUP PLC	Information Assurance Services	762
FORTINET INC	Enterprise Security Salutions	15,122
INTEL CORP	McAfoo/Hardwaro Enablod Socurity	212,060

	DRING	MENTAL SC	1-UP QUANTA	BOTTON	
		ORE	STYLES C		
Bl SCO	НОМЕНТИН	QUALITT	PROFITABILITT	GROWTH	TALUATION
60:	48%	63%	56%	49%	70%
592	49%	68%	43%	31%	77%
582	67%	47%	65%	51%	63%
582	53%	61%	60%	57%	57%
582	65%	57%	62%	50%	57%
572	39%	58%	63%	45%	68%
565	63%	63%	70%	63%	38%
565	37%	65%	55%	42%	67%
55:	84%	60%	68%	80%	18%
55:	29%	65%	57%	46%	64%

				TOP	-DOWN	COMP	ETITIVE S	CORING	ì				
	Cyber Secur ity	try Exper	Segm ent Comp	Client Revie ws			CYBE	R SEC	URITY	SEGME	NTS		
TD SCORE	Overall Expurere Scure	CyberSe curity Tentures Scure	Overall Competi tive Score	X Perc Scare	Applicat ion Security	Claud Security	Data Security	Identity Access Heneqe ment	Infrartru ctura Pratacti an	Intograt od Rirk Hanago mont	Hetuurk Security	Security Services	Couromo r Socurity Softwar
71%	67%	Jot Ranke	75%										
57%	34%	lot Ranke	80%										
73%	67%	77.0%	75%										
68%	79%	94.0%	47%	51%									
80%	67%	97.2%	75%										
77%	67%	88.2%	75%										
62%	89%	79.8%	61%	19%									
67%	87%	65.5%	48%										
67%	77%	95.0%	54%	41%									
55%	13%	95.8%	65%	47%									

Booz Allen Hamilton (BAH US)

Booz Allen Hamilton Holding (BAH) is a provider of management consulting services and technology services to the U.S. government, such as cloud computing and cyber security consulting, and engineering consulting. In addition to the U.S. government, BAH provides its management and technology consulting services to large corporations, institutions, and non-profit organisations with operations around the globe.

BAH was the only candidate shortlisted in all the 3 screens showing above average scores for all the dimensions considered: Valuation, Growth, Profitability, Quality and Momentum.

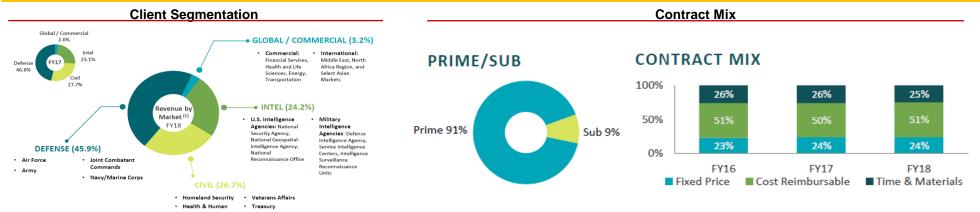
FINANCIAL RATIOS ANALYSIS		PERCI	ENTILE T12	M vs H
THEATECIAE NATION ANALISIS		10YR		
Fiscal year ends in March.	T12M	AVG	5YR AVG	3YR AVG
Growth				
T12M Sales	7.1%	67%	80%	67%
T12M Operating Income T12M EBITDA	12.4% 14.6%	78% 78%	100%	100% 100%
Basic EPS	33.5%	86%	100%	100%
Diluted EPS	32.5%	86%	100%	100%
CFO	-8.4%	33%	40%	33%
FCF	-13.7%	33%	40%	33%
Dupont				
Return on Com Eqty	54.4% 54.4%	67% 67%	40% 40%	67%
Normalized ROE Return on assets	9.1%	89%	80%	67% 67%
Trailing 12M Operating Margin	8.6%	89%	80%	100%
Asset Turnover	1.74	11%	0%	0%
Financial Leverage	6.0	44%	0%	0%
Profitability				
Trailing 12M Gross Margin	53.3%	78%	60%	33%
Trailing 12M Operating Margin	8.6%	89%	80%	100%
EBIT Margin	7.2%	89%	80%	100%
Trailing 12M Profit Margin Efficiency	5.2%	89%	80%	67%
T12 A/R turn-days	73	100%	100%	100%
T12 Inv turn-days				
Accounts Payable Turnover Days	39	100%	100%	100%
Cash Cycle	73	100%	100%	100%
Cash Conversion Cycle	33	100%	100%	100%
A/R turnover	5.0	0%	0%	0%
Inv. turnover Accounts Payable Turnover	9.2	0%	0%	0%
Liquidity	5.2	076	070	0/0
Working Capital to Sales	7.7%	56%	100%	100%
Current Ratio	1.5	67%	100%	100%
Quick ratio	1.4	56%	100%	100%
Cash ratio	14.7%	0%	0%	0%
Cash & ST Investments to Trailing 12M Sales	2.4%	0%	0%	0%
EBIT/total interest exp Dvd coverage	6.2 2.8	33% 71%	20% 80%	0% 67%
Solvency	2.8	/176	80%	0/%
Net debt	1654	100%	100%	100%
Tot Debt / Total Assets	0.50	33%	20%	33%
LT Debt / Tot Assets	0.48	33%	20%	33%
LT Debt / Total Equity	2.9	33%	20%	33%
Net Debt / Tot Equity	2.7	44%	20%	33%
Total Debt / T12M EBITDA FCF / Total Debt	2.98 0.14	22% 11%	0% 20%	0% 33%
Net Debt-to-EBITDA	2.7	78%	80%	67%
Quality	27	70,0	0070	0770
Book-to-Bill Ratio	1.48	80%	80%	67%
WACC	9.2	67%	80%	67%
ROIC	16.8	89%	80%	67%
EVA Spread	7.6	89%	80%	67%
CFO-to-Sales CFO-to-Net Income	5.3% 1.0	33% 11%	20% 20%	33% 33%
T12M CFO-to-Net Income	1.0	11%	20%	33%
T12M FCF / EBITDA	0.41	11%	20%	33%
T12M FCF / Sales	4.0%	22%	20%	33%
Capital Expenditure to Depreciation Expense	1.3	100%	100%	100%
Goodwill to Assets %	44%	56%	20%	0%
Goodwill+Intang to Assets %	51%	67%	40%	33%
Accruals / Tot Assets Cumulative Accruals / Tot Assets %	-0.2% -36.	89% 3%	80% 6%	67% 13%
Accounts Receivable Growth To Sales Growth	2.6	100%	100%	100%
Inventory Growth To Sales Growth	2.0	20073	20073	200,0
T12M Eff Tax Rate	27.4%	11%	20%	33%
Altman's Z-Score	2.81	89%	100%	100%

Investment Rationale - BUY - Upside Average +24% or 62.97 USD 12-month Target Price with +16%-32% total return scenarios

- Moat: BAH displays a significant score from our competitive analysis on the back of its nature as Defence Contractor, long track record serving the US Government, healthy backlog and industry experts opinion.
- · High Barriers of Entry: Defence contractors inherently have long term relationships with Governments that build trust in the long term.
- Multiple megatrends exposure: Cyber Security IT expenditure has been lagging penetration of new technologic trends such as IoT, EV/AV, Cloud computing and corporate digitalization. Things are getting even worse.
- Vision 2020: BAH showing good track record towards attaining its Vision 2020 plan with earnings expected to grow double-digit by 2020.
- Significant quality improvement: recent developments (gaining new contracts) and megatrends kicking in the next years are helping BAH to improve its business quality e.g. EVA (Economic Value Added) boost.
- New Growth opportunities: BAH is also starting to become more aggressive with large corporate clients with recent BAH's deals tapping into high-growth Cyber technologies (Cloud Security) and new geographic areas.
- Shareholder-friendly policy: sustainable dividends are not usual standard in the Cyber Security universe, yet BAH has displayed significant commitment sharing dividend and carrying out buyback programs.
- M&A target: BAH's size (7bn USD), public float (97.5% Mkt Cap) and cheaper valuation than peers despite its positioning in high-growth areas over the last years makes it a good target within the Cyber Security space.
- Consensus falling behind: BAH management is delivering in line with Vision 2020 guidance but Consensus not pricing medium-to-long term targets:
- Valuation: BAH PTS, PER and EV/EBITDA are below Cyber stocks average. Narrowing it to close peers within the Defence space (e.g. Mantech International) yields an upside +19%-35% (Average +27% or 62.97 USD).
- Momentum: BAH's recent contract success (1bn 6-year contract with 6 US agencies), GDPR boosting low base corporate business and November's US Midterm elections to boost sentiment for Cyber Security stocks.

Risks

- Cyber Security sell-off: BAH is sensitive in sentiment changes for the Cyber Security Theme and increasing active and passive funds (e.g. PureFunds ISE Cyber Security ETF) activity despite BAH's reduced weight in the index (1% Weight).
- Competitive risks: stricter or worse than expected Cyber Security Budgets for the next 5 years will dampen BAH story. Although the probability of this risk is low bearing in mind how hack attacks and malicious data usage are expected to increase.
- · Hacking and Leak risk: 2013's Edward Snowden (BAH employee at the time) caused brand tarnishment but no commercial damage as BAH has recovered significantly since then.
- Corporate ventures disappointing: BAH experience competing in the corporate arena and poses a risk of slashing rates to penetrate demand, yet the bright side is that the percentage of this niche is still too small to hurt overall profitability.
- FCF generation weakness lingers: BAH FCF generation has been its soft spot as the proportion of funded contracts has diminished below historical averages (16% vs 22% Historical average).
- Style risks: BAH and Cyber Security stocks overall display a significant bias towards Growth and Small Cap style so any rallies in Value or Large Cap stocks could be a downside risk.



Booz Allen Hamilton (BAH US)

Fiscal year ends in March. Growth T12M Sales T12M Operating Income T12M EBITDA Basic EPS Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Operating Margin -9.79 EBIT Margin -11.81 Trailing 12M Operating Margin -29.55 Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash S T. Investage Tailing 13M Sales	17.7% -147.5% -191% -4600% -525% 3.2% 3.2% 3.9% 4.0 6 48.2% 6 3.9% 6 1.64 4.0 6 48.2% 6 5.3	9.1% 59.5% 16% 10% -6% 12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5%	2012-03 4.8% 26.3% 37% 147% 147% 36% 22.9% 22.9% 22.9% 3.0 49.9% 4.185 3.0 67 32 5.4 10.2	2013-03 -1.7% 10.7% 10.7% -15% -15% 29% 53% 31.0% 6.7% 7.7% 4.6 -50.1% 7.7% 6.4% 3.6% -66 -66 -66 -66 -66 -78 -78 -78 -78 -78 -78 -78 -78 -78 -78	2014-03 -4.8% 3.4% 4% 6% 6% -28% -28% 116.3% 7.6% 8.4% 1.79 15.3 -50.4% 8.4% 7.0% 4.2% -64 -64 -64 -64 -64 -60 -60 -60 -60 -60 -60 -60 -60 -60 -60	2015-03 -3.7% -0.4% -2.2% -1.2% -1.2% -12% 130.2% 130.2% 8.0% 8.7% 7.3% 4.3% 61 33 61 27 5.9	2016-03 2.5% -3.1% -3.1% -2% 25% 28% -33% -99.0% -33% -99.0% 52.3% 8.2% -7.0% 5.4% -58 -52.3% -58 -62 -62	7.4% 8.8% 4% -15% -14% 53% 7.9% 51.3% 7.9% 8.3% 7.19% 4.3% 58 35 58 24 6.2	6.3% 7.4% 10% 23% -3% -3% -11% -11% -1.1%	7.19M 7.194 12.4% 14.6% 33.5% 32.5% -8.4% 54.4% 9.198 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 42.7% 42.7% 42.7% 6.0 53.1% 8.2% 6.9% 4.3%
T12M Sales T12M Operating Income T12M EBITDA Basic EPS Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin Financial Leverage Profitability Trailing 12M Operating Margin -9.79 EBIT Margin -11.88 Trailing 12M Profit Margin -29.55 Efficiency T12 //R turn-days T12 //R turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-147.5% -191% -4600% -525% 3.2% 3.2% 3.9% 1.64 4.0 6 48.2% 6 1.0% 6 0.5% 68 5.3	59.5% 16% 10% -6% 12.0% 12.0% 12.0% 2.8% 5.7% 43.3% 5.7% 2.3% 1.5% 69 69 5.3	26.3% 37% 158% 128% 22% 36% 22.9% 22.9% 7.6% 6.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	10.7% 10% -15% -29% -31.0% 31.0% 6.7% 7.7% 4.6 -50.1% 6.4% 3.6% -66 -32 -5.5	3.4% 4% 4% 6% -28% -28% 116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	-0.4% -2% -2% -2% -1% -7% -128 130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 4.3% 61 33 61 27 5.9	-3.1% -2% 25% 28% -20% -33% 99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	8.8% 4% 415-15% -14% 53% 79% 51.3% 51.3% 51.3% 51.3% 6.5 53.6% 8.3% 7.1% 4.3% 58	7.4% 10% 23% 23% -3% -11% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.19 4.9%	12.4% 14.6% 33.5% -8.4% -13.7% 54.4% 54.4% 54.4% 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
T12M Operating Income T12M EBITDA Basic EPS Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin -9.79 EBIT Margin -11.8i Trailing 12M Profit Margin -29.55 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-147.5% -191% -4600% -525% 3.2% 3.2% 3.9% 1.64 4.0 6 48.2% 6 1.0% 6 0.5% 68 5.3	59.5% 16% 10% -6% 12.0% 12.0% 12.0% 2.8% 5.7% 43.3% 5.7% 2.3% 1.5% 69 69 5.3	26.3% 37% 158% 128% 22% 36% 22.9% 22.9% 7.6% 6.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	10.7% 10% -15% -29% -31.0% 31.0% 6.7% 7.7% 4.6 -50.1% 6.4% 3.6% -66 -32 -5.5	3.4% 4% 4% 6% -28% -28% 116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	-0.4% -2% -2% -2% -1% -7% -128 130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 4.3% 61 33 61 27 5.9	-3.1% -2% 25% 28% -20% -33% 99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	8.8% 4% 415-15% -14% 53% 79% 51.3% 51.3% 51.3% 51.3% 6.5 53.6% 8.3% 7.1% 4.3% 58	7.4% 10% 23% 23% -3% -11% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.19 4.9%	12.4% 14.6% 33.5% -8.4% -13.7% 54.4% 54.4% 54.4% 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
T12M EBITDA Basic EPS Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 47.49 EBIT Margin 47.49 EBIT Margin 47.49 EBIT Margin 47.49 Cash Canuta Payabic Turnova Accounts Payabic Turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-4600% -525% 3.2% 3.2% 3.8% 1.64 4.0 6 48.2% 6 1.0% 6 0.5% 68 5.3	16% 10% -6% 12.0% 12.0% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	37% 147% 158% 22% 36% 22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	10% -15% -15% -15% 29% 53% 31.0% 6.7% 7.7% 4.6 	4% 4% 6% 628 -28% -28% 116.3% 7.6% 8.4% 7.05 4.2% 64 34 64 30 5.6	-2% -2% -1% -7% -12% 130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	-2% 25% 28% -20% -33% -33% -99.0% 10.0% 8.2% 7.0% 54.3% 58.3% 32.58 26.6.2	4% -15% -14% 53% 79% 51.3% 51.3% 7.9% 8.3% 6.5 53.6% 8.3% 7.19 4.3% 58 35 58 24 6.2	10% 23% 23% -3% -11% 54.0% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 4.9%	14.6% 33.5% 32.5% -8.4% -13.7% 54.4% 9.1% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Basic EPS Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin -9.79 EBIT Margin -11.88 Trailing 12M Profit Margin -29.55 Efficiency T12 A/R turn-days T12 I/R turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-4600% -525% 3.2% 3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% % 1.0% 6 68 68 5.3	10% -6% -6% -12.0% -2.8% -5.7% -2.3% -1.5% -69 -5.3 -9.7%	147% 158% 22% 36% 22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	-15% -15% 29% 53% 31.0% 6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6%	116.3% 128% 116.3% 116.3% 1.79 15.3 50.4% 8.4% 1.79 4.2% 64 34 64 30 5.6	-2% -1% -7% -12% -12% -130.2% 8.0% 8.7% 1.82 -16.2 -50.8% 8.7% 7.3% 4.3% -61 -27 5.9	25% 28% -20% -33% 99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	-15% -14% 53% 79% 51.3% 7.9% 8.3% 7.9% 8.3% 7.19 4.3% 58 35 58 24 6.2	23% 23% -3% -11% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 4.9%	33.5% 32.5% -8.4% -13.7% 54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2%	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Diluted EPS CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin -9.79 EBIT Margin -11.88 Trailing 12M Profit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-525% 3.2% 3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 68 68 5.3	12.0% 12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	158% 22% 36% 22.9% 22.9% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	-15% 29% 53% 31.0% 31.0% 6.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 32 5.5	6% -28% -28% -28% -116.3% -16.3% -7.6% -8.4% -1.79 -15.3 -50.4% -8.4% -7.0% -4.2% -64 -30 -5.6 -64 -30 -5.6	130.2% -12% -12% -1230.2% 8.0% 8.7% 1.82 16.2 	28% -20% -33% 99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	-14% 53% 79% 51.3% 51.3% 51.3% 51.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	23% -3% -11% 54.0% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	32.5% -8.4% -13.7% 54.4% 54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
CFO FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Profit Margin 47.49 Trailing 12M Profit Margin 47.49 T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	-525% 3.2% 3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 68 68 5.3	12.0% 12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	22% 36% 22.9% 22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	29% 53% 31.0% 31.0% 6.7% 7.7% 4.6 50.1% 7.7% 6.4% 3.6% 66 32 5.5	-28% -28% -28% 116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	-7% -12% 130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	-20% -33% 99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58	53% 79% 51.3% 51.3% 7.9% 8.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3%	54.0% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	-8.4% -13.7% 54.4% 54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
FCF Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Trailing 12M Forth Margin 47.49 Trailing 12M Trailing 12M Port Margin 47.49 Trailing 12M Trailing 12M Port Margin 47.49 Trailing 12M Operating Margin 47.49 EBIT Margin 47.49 Trailing 12M Operating Margin 47.49 EBIT Margin 47.49 Trailing 12M Operating Margin 47.49	-525% 3.2% 3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 68 68 5.3	12.0% 12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	22.9% 22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	53% 31.0% 6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	116.3% 116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2%	130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3%	99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58	51.3% 51.3% 7.9% 8.3% 1.82 6.5 53.6% 8.3% 7.13% 58 35 58 24 6.2	54.0% 54.0% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	-13.7% 54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Dupont Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin -9.79 EBIT Margin -11.8* Trailing 12M Profit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	3.2% 3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 5.3	12.0% 12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 69 69 5.3	22.9% 22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	31.0% 31.0% 6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	116.3% 116.3% 7.6.4% 1.79 15.3 50.4% 7.0% 4.2% 64 34 64 30 5.6	130.2% 130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 27 5.9	99.0% 99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	51.3% 51.3% 7.9% 8.3% 1.82 6.5 53.6% 4.3% 58 35 58 4.6.2	54.0% 54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	54.4% 54.4% 9.1% 8.6% 1.74 6.0 53.3% 5.2% 73 39 73 33 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Return on Com Eqty Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Profit Margin 47.49 Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 47.49 Trailing 12M Operation Margin 47.49 Trailing 12M Operat	3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% % 1.0% 6 0.5% 68 5.3	12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	31.0% 6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 66.2	51.3% 7.9% 8.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58	54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 39 73 30 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Normalized ROE Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Operating Margin 47.49 Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin 47.49 Trailing 12M Profit Margin -9.78 EBIT Margin -11.88 Trailing 12M Profit Margin -29.55 Efficiency 112 /R turn-days 112 In vturn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	3.2% 0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% % 1.0% 6 0.5% 68 5.3	12.0% 2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	22.9% 7.6% 6.9% 1.85 3.0 49.9% 6.9% 4.1% 67 35 67 32 5.4	31.0% 6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	116.3% 7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	130.2% 8.0% 8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	99.0% 10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 66.2	51.3% 7.9% 8.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58	54.0% 8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9%	54.4% 9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 39 73 30 5.0	42.7% 7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Return on assets Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 9.79 EBIT Margin -11.81 Trailing 12M Operating Margin -29.55 Efficiency T12 A/R turn-days T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	0.8% 3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 5.3	2.8% 5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	7.6% 6.9% 1.85 3.0 49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	6.7% 7.7% 1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	7.6% 8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	8.0% 8.7% 1.82 16.2 50.8% 8.7% 4.3% 61 27 5.9	10.0% 8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	7.9% 8.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	8.7% 8.4% 1.77 6.2 53.5% 8.4% 7.1% 4.9% 62 38 62 24	9.1% 8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 39 5.0	7.2% 8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3%
Trailing 12M Operating Margin Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin 9-79 EBIT Margin -11.89 Trailing 12M Profit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	3.9% 1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 68 5.3	5.7% 1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	6.9% 1.85 3.0 49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	7.7% 1.77 4.6 50.1% 6.4% 3.6% 66 34 66 32 5.5	8.4% 1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	8.7% 1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 27 5.9	8.2% 1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	8.3% 1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	53.5% 8.4% 7.1% 4.9% 62 38 62 24	8.6% 1.74 6.0 53.3% 8.6% 7.2% 5.2%	8.2% 1.65 6.0 53.1% 8.2% 6.9% 4.3%
Asset Turnover Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 9.79 EBIT Margin -11.81 Trailing 12M Profit Margin -29.55 Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	1.64 4.0 6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 68 5.3	1.84 4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	1.85 3.0 49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	1.77 4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	1.79 15.3 50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	1.82 16.2 50.8% 8.7% 7.3% 4.3% 61 27 5.9	1.84 9.9 52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	1.82 6.5 53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	1.77 6.2 53.5% 8.4% 7.1% 4.9% 62 38 62 24	1.74 6.0 53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	1.65 6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Financial Leverage Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin -9.79 EBIT Margin -11.88 Trailing 12M Pofit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	4.0 6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 68 5.3	4.3 49.3% 5.7% 2.3% 1.5% 69 69 5.3	3.0 49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	4.6 50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	6.2 53.5% 8.4% 7.1% 4.9% 62 38 62 24	53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	6.0 53.1% 8.2% 6.9% 4.3% 65 35 65 30
Profitability Trailing 12M Gross Margin 47.49 Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 9.79 EBIT Margin -11.89 Trailing 12M Profit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	6 48.2% 6 3.9% 6 1.0% 6 0.5% 68 68 5.3	49.3% 5.7% 2.3% 1.5% 69 69 5.3	49.9% 6.9% 5.9% 4.1% 67 35 67 32 5.4	50.1% 7.7% 6.4% 3.6% 66 34 66 32 5.5	50.4% 8.4% 7.0% 4.2% 64 34 64 30 5.6	50.8% 8.7% 7.3% 4.3% 61 33 61 27 5.9	52.3% 8.2% 7.0% 5.4% 58 32 58 26 6.2	53.6% 8.3% 7.1% 4.3% 58 35 58 24 6.2	53.5% 8.4% 7.1% 4.9% 62 38 62 24	53.3% 8.6% 7.2% 5.2% 73 39 73 33 5.0	53.1% 8.2% 6.9% 4.3% 65 35 65 30
Trailing 12M Gross Margin 47.49 Trailing 12M Operating Margin 9.78 EBIT Margin -11.88 Trailing 12M Profit Margin -29.53 Efficiency 112 AVR turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Inv. turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	6 3.9% 6 1.0% 6 0.5% 68 68 5.3	5.7% 2.3% 1.5% 69 69 5.3	6.9% 5.9% 4.1% 67 35 67 32 5.4	7.7% 6.4% 3.6% 66 34 66 32 5.5	8.4% 7.0% 4.2% 64 34 64 30 5.6	8.7% 7.3% 4.3% 61 33 61 27 5.9	8.2% 7.0% 5.4% 58 32 58 26 6.2	8.3% 7.1% 4.3% 58 35 58 24 6.2	8.4% 7.1% 4.9% 62 38 62 24	8.6% 7.2% 5.2% 73 39 73 33 5.0	8.2% 6.9% 4.3% 65 35 65 30
Trailing 12M Operating Margin -9.7% EBIT Margin -11.8* Trailing 12M Profit Margin -29.55 Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	6 3.9% 6 1.0% 6 0.5% 68 68 5.3	5.7% 2.3% 1.5% 69 69 5.3	6.9% 5.9% 4.1% 67 35 67 32 5.4	7.7% 6.4% 3.6% 66 34 66 32 5.5	8.4% 7.0% 4.2% 64 34 64 30 5.6	8.7% 7.3% 4.3% 61 33 61 27 5.9	8.2% 7.0% 5.4% 58 32 58 26 6.2	8.3% 7.1% 4.3% 58 35 58 24 6.2	8.4% 7.1% 4.9% 62 38 62 24	8.6% 7.2% 5.2% 73 39 73 33 5.0	8.2% 6.9% 4.3% 65 35 65 30
EBIT Margin -11.85 Trailing 12M Profit Margin -29.55 Efficiency T12 A/R turn-days T12 Inv turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	68 68 5.3	2.3% 1.5% 69 69 5.3	5.9% 4.1% 67 35 67 32 5.4	6.4% 3.6% 66 34 66 32 5.5	7.0% 4.2% 64 34 64 30 5.6	7.3% 4.3% 61 33 61 27 5.9	7.0% 5.4% 58 32 58 26 6.2	7.1% 4.3% 58 35 58 24 6.2	7.1% 4.9% 62 38 62 24	7.2% 5.2% 73 39 73 33 5.0	6.9% 4.3% 65 35 65 30
Trailing 12M Profit Margin -29.59 Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	68 68 5.3 13.4%	1.5% 69 69 5.3	4.1% 67 35 67 32 5.4	3.6% 66 34 66 32 5.5	4.2% 64 34 64 30 5.6	4.3% 61 33 61 27 5.9	5.4% 58 32 58 26 6.2	4.3% 58 35 58 24 6.2	4.9% 62 38 62 24	73 39 73 33 5.0	4.3% 65 35 65 30
Efficiency T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	68 68 5.3 13.4% 1.7	69 69 5.3	67 35 67 32 5.4	66 34 66 32 5.5	64 34 64 30 5.6	61 33 61 27 5.9	58 32 58 26 6.2	58 35 58 24 6.2	62 38 62 24	73 39 73 33 5.0	65 35 65 30
T12 A/R turn-days T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	68 5.3 13.4% 1.7	69 5.3 9.7%	35 67 32 5.4	34 66 32 5.5	34 64 30 5.6	33 61 27 5.9	32 58 26 6.2	35 58 24 6.2	38 62 24	39 73 33 5.0	35 65 30
T12 Inv turn-days Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	68 5.3 13.4% 1.7	69 5.3 9.7%	35 67 32 5.4	34 66 32 5.5	34 64 30 5.6	33 61 27 5.9	32 58 26 6.2	35 58 24 6.2	38 62 24	39 73 33 5.0	35 65 30
Accounts Payable Turnover Days Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	5.3 13.4% 1.7	9.7%	67 32 5.4 10.2	66 32 5.5	64 30 5.6	61 27 5.9	58 26 6.2	58 24 6.2	62 24	73 33 5.0	65 30
Cash Cycle Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	5.3 13.4% 1.7	9.7%	67 32 5.4 10.2	66 32 5.5	64 30 5.6	61 27 5.9	58 26 6.2	58 24 6.2	62 24	73 33 5.0	65 30
Cash Conversion Cycle A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	5.3 13.4% 1.7	9.7%	32 5.4 10.2	32 5.5	30 5.6	27 5.9	26 6.2	24 6.2	24	33 5.0	30
A/R turnover Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	13.4%	9.7%	5.4	5.5	5.6	5.9	6.2	6.2		5.0	
Inv. turnover Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick tatio Cash ratio	13.4%	9.7%	10.2						5.8		5.5
Accounts Payable Turnover Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	1.7			10.7	10.6	10.0	11.1				
Liquidity Working Capital to Sales Current Ratio Quick ratio Cash ratio	1.7			10.7	10.6		44.4				
Working Capital to Sales Current Ratio Quick ratio Cash ratio	1.7		10.6%			10.8	11.1	10.4	9.4	9.2	10.3
Current Ratio Quick ratio Cash ratio	1.7		10.6%								
Quick ratio Cash ratio				10.4%	7.3%	6.1%	5.1%	3.8%	5.2%	7.7%	9.5%
Cash ratio		1.6	1.8	1.5	1.4	1.4	1.3	1.2	1.4	1.5	1.6
	1.7	1.5	1.7	1.4	1.3	1.3	1.1	1.1	1.4	1.4	1.5
Cash 9 CT Investments to Trailing 13M Cal	39.2%	22.3%	53.0%	36.3%	28.4%	24.4%	20.0%	19.7%	27.7%	14.7%	35.7%
Cash & ST Investments to Trailing 12M Sales	7.1%	4.5%	5.8%	7.2%	5.6%	4.4%	3.7%	3.5%	4.1%	2.4%	5.7%
EBIT/total interest exp	1.3	2.4	8.4	6.4	5.9	6.4	6.3	7.8	6.3	6.2	7.5
Dvd coverage		0.4		23.6	0.4	0.9	1.3	2.3	3.5	2.8	2.4
Solvency											
Net debt 815	1261	801	481	1366	1399	1406	1409	1446	1531	1654	1525
Tot Debt / Total Assets 0.39	0.51	0.33	0.29	0.54	0.56	0.56	0.53	0.49	0.50	0.50	0.52
LT Debt / Tot Assets 0.38		0.32	0.28	0.52	0.54	0.54	0.49	0.44	0.49	0.48	0.50
LT Debt / Total Equity 1.2	3.0	1.1	0.8	7.3	9.2	8.4	3.6	2.6	3.2	2.9	3.0
Net Debt / Tot Equity 0.8	2.5	0.9	0.4	6.0	8.1	7.6	3.5	2.5	2.8	2.7	2.5
Total Debt / T12M EBITDA -3.81	5.32	2.91	2.07	3.35	3.12	3.10	3.12	3.11	3.11	2.98	3.52
FCF / Total Debt -0.04	0.14	0.21	0.29	0.25	0.19	0.17	0.11	0.20	0.16	0.14	0.17
Net Debt-to-EBITDA -2.5	4.3	2.3	1.0	2.7	2.6	2.7	2.8	2.7	2.6	2.7	2.9
Quality											
Book-to-Bill Ratio					0.69	0.91	1.45	1.31	1.49	1.48	1.36
WACC	7.9	10.9	12.7	8.9	8.3	8.8	8.7	8.4	9.2	9.2	
ROIC	4.9	11.0	14.1	12.5	13.9	14.3	17.6	13.8	15.4	16.8	
EVA Spread	-3.0	0.1	1.4	3.6	5.6	5.5	8.8	5.4	6.2	7.6	
CFO-to-Sales -0.1%	5.3%	5.3%	6.1%	8.1%	6.1%	5.9%	4.6%	6.6%	6.0%	5.3%	6.3%
CFO-to-Net Income 0.0	10.8	3.5	1.5	2.1	1.4	1.3	0.8	1.5	1.2	1.0	1.5
T12M CFO-to-Net Income 0.0	10.8	3.5	1.5	2.1	1.4	1.3	0.8	1.5	1.2	1.0	1.5
T12M FCF / EBITDA 0.16	0.75	0.61	0.61	0.84	0.59	0.53	0.36	0.61	0.50	0.41	0.60
T12M FCF / Sales -1.2%	4.3%	3.7%	4.8%	7.5%	5.7%	5.2%	3.4%	5.7%	4.7%	4.0%	5.3%
Capital Expenditure to Depreciation Expense 0.5	0.5	1.1	1.0	0.4	0.3	0.6	1.1	0.9	1.2	1.3	1.0
Goodwill to Assets % 36%	38%	38%	36%	40%	43%	46%	45%	47%	44%	44%	44%
Goodwill+Intang to Assets % 46%	47%	46%	43%	48%	51%	53%	53%	55%	51%	51%	51%
Accruals / Tot Assets	-7.8%	-6.9%	-3.8%	-7.6%	-3.3%	-2.7%	1.5%	-4.1%	-1.8%	-0.2%	-3.3%
Cumulative Accruals / Tot Assets %	-7.8	-14.8	-18.6	-26.1	-29.4	-32.1	-30.6	-34.6	-36.5	-36.	
Accounts Receivable Growth To Sales Growth	0.6	1.0	-0.6	2.5	2.3	1.8	1.6	1.5	2.2	2.6	
Inventory Growth To Sales Growth						39.6%	22 40/	38.6%	30.4%	27.4%	20.000
	6 49.0%	33.6%	30.2%	40.5%	39.1%	39.0%	22.4%	30.0%	30.476	27.4%	36.9%

HISTO	ORICAL AVE	RAGE	PERCENTILE T12M vs H			
10YR			10YR			
AVG	5YR AVG	3YR AVG	AVG	5YR AVG	3YR AVG	
4.5%	2.5%	5.8%	67%	80%	67%	
-2.2%	4.8%	6.4%	78%	100%	100%	
-10.0%	4.7%	6.7%	78%	100%	100%	
25.1%	11.4%	16.8%	86%	100%	100%	
27.1%	12.3%	17.3%	86%	100%	100%	
-455.3%	-2.2%	5.5%	33%	40%	33%	
-46.1%	-3.2%	5.2%	33%	40%	33%	
57.4%	84.2%	64.7%	67%	40%	67%	
			67%	40%	67%	
57.4% 6.9%	84.2% 8.6%	64.7% 8.9%	89%	80%	67%	
7.5%	8.4%	8.4%	89%	80%	100%	
1.79	1.80	1.79	11%	0%	0%	
7.6	10.0	7.1	44%	0%	0%	
7.0	10.0	7.12	1170	0,0	0,0	
51.1%	52.3%	53.2%	78%	60%	33%	
7.5%	8.4%	8.4%	89%	80%	100%	
5.8%	7.1%	7.1%	89%	80%	100%	
3.8%	4.7%	4.9%	89%	80%	67%	
65	63	63	100%	100%	100%	
35	35	36	100%	100%	100%	
65	63	63	100%	100%	100%	
29	27	27	100%	100%	100%	
5.6	5.8	5.8	0%	0%	0%	
10.3	10.3	10.0	0%	0%	0%	
7.9%	5.9%	5.5%	56%	100%	100%	
1.5	1.3	1.3	67%	100%	100%	
1.4	1.3	1.3	56%	100%	100%	
28.6%	22.5%	20.5%	0%	0%	0%	
4.8%	3.9%	3.4%	0%	0%	0%	
5.7	6.5	6.7	33%	20%	0%	
4.4	1.9	2.5	71%	80%	67%	
1275.4	1474.167	1510	100%	100%	100%	
0.48	0.53	0.51	33%	20%	33%	
0.46	0.50	0.47	33%	20%	33%	
4.2	5.0	3.1	33%	20%	33%	
3.7	4.5	2.9	44%	20%	33%	
3.22	3.09	3.08	22%	0%	0%	
0.19	0.16	0.15	11%	20%	33%	
2.6	2.7	2.7	78%	80%	67%	
1.2	1.2	1.4	80%	80%	679/	
9.3	1.2 8.8	1.4 8.9	67%	80%	67% 67%	
13.4	15.3	15.9	89%	80%	67%	
4.1	6.5	7.0	89%	80%	67%	
5.9%	5.7%	5.6%	33%	20%	33%	
2.5	1.2	1.1	11%	20%	33%	
2.5	1.2	1.1	11%	20%	33%	
0.58	0.50	0.47	11%	20%	33%	
4.9%	4.8%	4.4%	22%	20%	33%	
0.8	0.9	1.1	100%	100%	100%	
42%	45%	45%	56%	20%	0%	
50%	52%	52%	67%	40%	33%	
-3.7%	-1.8%	-1.1%	89%	80%	67%	
-25.6	-32.6	-33.9	3%	6%	13%	
1.5	2.0	2.0	100%	100%	100%	
35.1%	32.9%	29.7%	11%	20%	220/	
35.1% 2.63	32.9% 2.65	29.7%	11% 89%	100%	33% 100%	
2.03	2.00	2.00	0970	100%	100%	

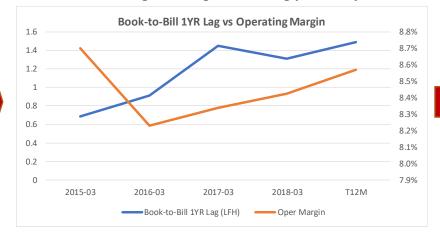
- **Growth:** Growth is line with Vision 2020 plan with the company expecting 6-9% Sales CAGR FY18-21. Book-to-bill ratio is confirming BAH is heading towards the high number of the range. Consensus is pricing 8% YoY for FY1 but falling short looking forward FY2 by 3% of Sales and 9% Adj EPS. Hence, BAH is delivering well above expectations but Consensus is still stuck on low-to-average outcomes thus yielding further room for upgrades continuation.
- **Profitability:** BAH profitability profile has improved dramatically (both Gross Margin and Operating Margin). Best yet is to find that BAH is able to growth its book-to-bill ratio while delivering top and bottom line profitability gains. In other words, BAH is not slashing rates to outbid rivals. The soft side here is the acute decline in Asset turnover (1.74 vs 1.8x Historical Average) on the back of a significant M&A activity during 2010-2014 as BAH aimed at consolidating its powerful position in Cyber Security and Intelligence. Last but not least, Vision 2020 plan is expecting 10-30 bps in margin expansion based on corporate and international expansion plus high-growth niches (Cloud Security).
- **WC management:** few changes to highlight as despite better terms with suppliers (lower payables turnover), the firm has lost bargaining power with clients (increase 6 days in collect receivables). In any case, nothing to worry about as the company cash conversion cycle is pretty stable at 30 days.
- **Liquidity:** Interest Cover is well above acceptable levels (6.2x > 4x IG Average) as well as the Dividend Cover (2.8x > 1.25x). Working Capital-to-Sales is also showing healthy signs despite having declined, which denotes better capital efficiency.
- **Solvency:** Although Net Debt-to-EBITDA can be considered high (2.5x), it has improved since 2010 and it still within IG rating levels. Moreover, Altman's Z-Score is in safe territory (2.85>1 Critical Threshold) and BAH announced a refinancing operation to reduce its interest expense further and provide more flexibility.
- Quality: Significant "moat" improvement as reflected by EVA spread ((+7.6% current vs 3.7% AVG 5YR) and EVA spread change YoY (+160 bps). In addition, BAH shows an excellent track record of low accruals: CFO-to-Net Income >1 and shrinking and low cumulative Normalized Accruals. The weak points are the excessive goodwill (44%) where BAH is gearing itself towards future within the next decade and off-balance sheet debt is present.
- Valuation: BAH is showing relative cheapness when compared against the Cyber Security Universe: PTS 1.1x vs 4.8x Peers, 3.5% FCFY vs 3% Peers, EV/EBITDA 13x vs 14.6x Peers. Checking closer peers within US Cyber Security Defence like Mantech International still is favourable for BAH: PTS 1.1 vs 1.4x MANT, FCFY 3.5% vs 3.3% MANT and EV/EBITDA 13x vs 14.4x MANT. Applying an Cyber Defence Ratio and DCF (2-stage, Guidance Projections) an approximate +24% total return upside or 62.97 USD Target Price with +16%(59 USD TP) to 32%(66.95 USD TP) total return range scenarios for the next 12 months.
- Momentum: Operating momentum is excellent with BAH having recently signed an important contract (1bn USD 6-year contract with 6 governmental agencies) and positive tone in its 1Q19 conference call. As a result, both earnings and price momentum have been positive triggering excellent +30% YTD performance. That said, short term traders have sent the shares south the last couple of weeks but sentiment remain encouraging with shares above 200d MA, Average Volume 5-20 days surging and 14D RSI suggesting an oversold status and, therefore, a good entry opportunity.

Booz Allen Hamilton (BAH US) - Investment Thesis In Charts

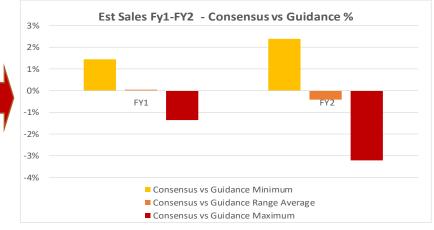
High Barriers of entry Cyber Security niche...



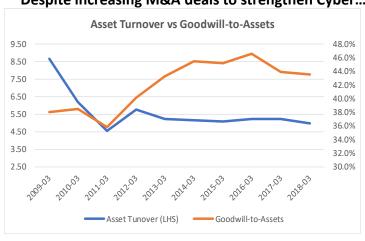
... allowing BAH to grow backlog profitably...



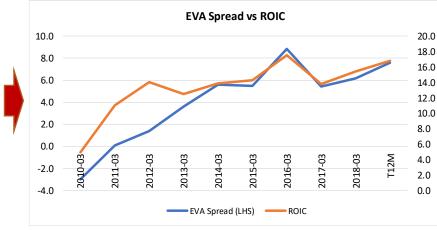
... while consensus not pricing yet all the story



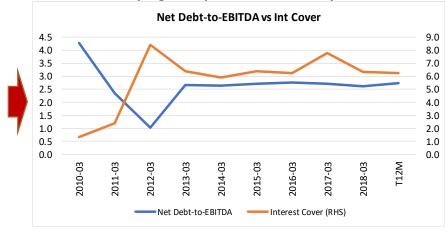
Despite increasing M&A deals to strengthen Cyber...







... helping to improve BAH's credit profile



Booz Allen Hamilton (BAH US) -

Trade Scalability Analysis

Trading Volume USD and Trading Algo Scenarios

		Trading Vol USD		TRADING ALGO	assuming Average \	/ol USD Scenario
	Maximum	Average	Minimum	5% Volume	10% Volume	15% Volume
2013	82,538,576.15	8,275,814	2,476,160.96	413,791	827,581	1,241,372
2014	110,220,563.96	15,044,129	3,384,783.93	752,206	1,504,413	2,256,619
2015	189,245,068.07	24,554,476	6,259,633.49	1,227,724	2,455,448	3,683,171
2016	278,435,353.86	30,827,141	7,563,186.49	1,541,357	3,082,714	4,624,071
2017	439,067,186.61	38,484,322	9,207,749.93	1,924,216	3,848,432	5,772,648
2018	134,764,467.84	39,648,550	11,847,635.11	1,982,428	3,964,855	5,947,283
2013-2018	439,067,187	28,134,873	2,476,160.96	1,406,744	2,813,487	4,220,231
2015-2018	439,067,187	36,320,004	7,563,186.49	1,816,000	3,632,000	5,448,001



Liquidity Simulation - Average Trading Vol USD Scenario

	% AuM Daily Liquidity for a 1000 mn USD AuM			Days to exit a position assuming 1% AuM allocation			
	5% Volume	10% Volume	15% Volume	5% Volume	10% Volume	15% Volume	
2013	0.04%	0.08%	0.12%	24.2	12.1	8.1	
2014	0.08%	0.15%	0.23%	13.3	6.6	4.4	
2015	0.12%	0.25%	0.37%	8.1	4.1	2.7	
2016	0.15%	0.31%	0.46%	6.5	3.2	2.2	
2017	0.19%	0.38%	0.58%	5.2	2.6	1.7	
2018	0.20%	0.40%	0.59%	5.0	2.5	1.7	
2013-2018	0.14%	0.28%	0.42%	7.1	3.6	2.4	
2015-2018	0.18%	0.36%	0.54%	5.5	2.8	1.8	

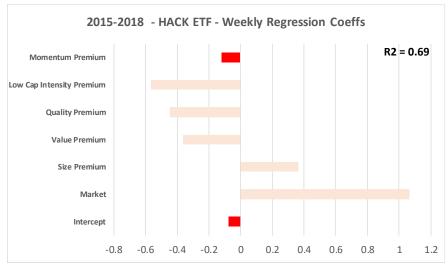
- BAH liquidity has increased remarkably since IPO (2010) over the last 3
 years with daily trading volume averaging 36 mill USD for 2015-18.
- Assuming a trading algo executing orders only for 5% of daily volumes, using an 2015-20178 average trading volume USD scenario, still provides a hefty 1.8 mill USD liquidity for 2015-18.
- A 1,000 bn USD mandate willing to allocate to BAH could allocate 1% of the portfolio and exit the trade in 1.8 days using a 15% volume algo and using a average trading Volume USD scenario.
- Worst Case scenario (not shown in the table): it will take 8.8 days to exit a 1% position if a minimum trading volume USD for the period 2015-218 occurred.

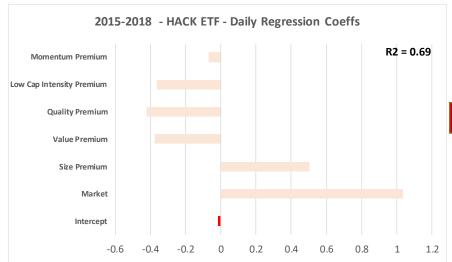


Cyber Security Index and Booz Allen Hamilton (BAH US) -

Style Analysis

Cyber Security ETF (HACK US) - STYLE ANALYSIS

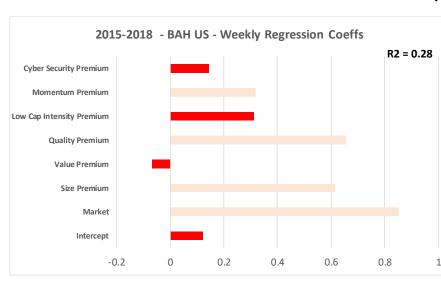


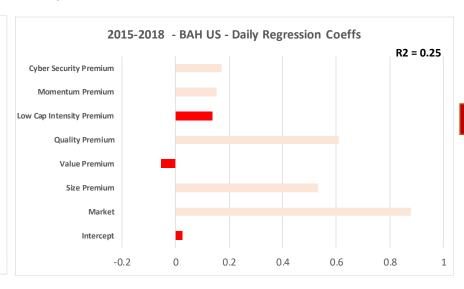


Cyber Security ETF has displayed significant positive sensitivity to small cap and market premium.

- On the other hand, the Cyber Security index is clearly exposed to Bad quality, Growth and High Capital Intensity premiums/styles.
- Momentum premium seems to be significant but not very high no matter if we measure it via daily or weekly returns.
- A PM should go long the Cyber Index or a tracker basket assuming he wants to be exposed to a High Growth Small Cap Bad Quality bias strategy with high market beta.

Booz Hallen Hamilton (BAH US) - STYLE ANALYSIS





- BAH is largely positively exposed to Quality,
 Size and Market Premiums as well as to to
 Momentum and Cyber Security Index.
- The company maintains the Growth bias of the Cyber Security industry, yet this sensitivity is not as pronounced.
- BAH offers a higher sensitivity to factors where the Cyber Security index is negatively exposed i.e. Quality and Momentum.
- Bear in mind that BAH's regression's R2 is very low (0.25), yet this analysis is helpful to have an style sensitivity approximation.
- A PM willing to play Cyber Security with some quality bias, momentum sensitivity while keeping the a low market beta small cap growth bias should go long BAH.

Note: bars in red are coefficients with p-values>10% i.e. statistically non-significant. Factor risk premium defined as FF RMW factor (high profitability) and Low Capital intensity premium as FF CMA (Low Capital Expenditure).